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HUNTERS POINT
SSIC NO. 5090.3.A

Doug Bielskis

From: Kito, Melanie R CIV NAVFAC SW <melanie.kito@navy.mil>
Sent: Wednesday, July 11, 2007 12:03 PM
To: Doug Bielskis; Neil.Hey@Shawgrp.com
Subject: FW: EPA comments on Parcel E-2 RI/FS
Attachments: E-2RIFS.comments.epa.doc

FYI

-----Original Message-----
From: Ripperda.Mark@epamail.epa.gov
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Sent: Wednesday, July 11, 2007 11:33
To: James Ponton
Cc: Amy.Brownell@sfdph.org; Forman, Keith S CIV OASN (I&E) BRAC PMO West; Kito, Melanie R CIV NAVFAC SW; steve.hall@ttemi.com; TLanphar@dtsc.ca.gov
Subject: EPA comments on Parcel E-2 RI/FS

Hi Melanie, here are our comments on the landfill.

(See attached file: E-2RIFS.comments.epa.doc)

Review of the Draft Parcel E-2 Remedial Investigation/Feasibility Study
Hunters Point Shipyard, San Francisco, California, March 2007

GENERAL COMMENTS

1. Additional alternatives must be evaluated. It is not sufficient to just look at complete removal and presumptive containment. While containment may be appropriate for the upland main fill area, removals and better wetland design must be evaluated for the near shore areas. Please hold a conceptual design meeting with the Department of Fish and Game and the State Parks wetlands construction team to come up with a more complete shoreline plan that better integrates with the adjoining State Parks plan. I would defer to wetlands and shoreline experts for actual alternatives, but possibilities include additional delineation and hot spot removal in the Panhandle with only a soil cover, not an engineered cap on the Panhandle. Erosion could then be controlled by a sandbar island located offshore instead of a concrete revetment/rip-rap. Similar removals should be evaluated for the rest of the shoreline so that the cap does not terminate at the shore. An engineered cap may also not be necessary for the East Adjacent Area.

2. This landfill does not meet the requirements for a presumptive containment remedy. EPA guidance states that the presumptive landfill containment remedy may not be appropriate for landfills with higher proportions of industrial waste such as that typically found at military shipyard or aircraft maintenance stations, or at landfills located near sensitive ecological habitats. The fact that this landfill directly adjoins the SF Bay, and that contaminant source areas have been located along the shore means that a remedial alternative addressing hot-spot or partial removal of fill material must be added to the Feasibility Study. Please re-write all references to the presumptive remedy to make it clear that while the presumptive remedy for landfills provides useful guidance for this site, this site does not qualify for an automatic application of a containment presumptive remedy. Containment may be a valid remedy, but show it through an evaluation of the data and pathways.

3. Groundwater discharge to the Bay must be better evaluated and a containment or treatment remedy proposed as necessary. The current document compares groundwater to a variety of screening criteria. Please develop a single set of remedial goals for groundwater discharging to the Bay (the California Toxics Rule is an ARAR and should be the main starting point). The current rates of groundwater infiltration and discharge from the landfill, and a total contaminant mass balance, are not presented in the RI/FS Report. Both the concentrations and mass flux of contaminants exceeding the remedial goals should be evaluated and remedies proposed as appropriate.

4. Metal slag has been observed on the shoreline west of the PCB Hot Spot Area. Please include a plan to evaluate and/or address this metal slag in the next version of the RI/FS.

5. The extent of groundwater contamination along the shoreline of Parcel E-2 is a data gap. To fill in this data gap new A-Aquifer wells are needed in the tidally influenced zone

(TIZ) of the Panhandle and Landfill areas. Monitoring wells are needed between Well IR01MW48A and IR01MW38A, between IR01MW38A and IR01MWI-3, and outside the waste boundary, southwest of IR01MW38A.

6. The proposed improved cap and revetment do not take into account expected rise in sea level during the post-closure period. As sea level rises, the landfill shoreline will be subject to higher tides and wave action. Please account for rising sea level in the analysis and design.

7. Alternative 2 (excavation and off-site disposal) assumes that the entire contents of the landfill and adjacent waste sites (1,162,000 cubic yards) would be removed, screened, and replaced with clean soil, which would cost approximately $330 million. Selective removal of wastes of concern, and avoiding excavation of non-hazardous demolition debris, etc., is not considered, although it may be feasible and effective to remove only a small percentage of the total waste volume or to remove hot spots, particularly in areas adjacent to the Bay. Successful implementation of this approach would require detailed assessments of hot spots, and agreement on field criteria for leaving wastes in place. Please utilize this approach in a new alternative.

SPECIFIC COMMENTS

1. **Section ES.2.1, Solid Waste and Soil in the Landfill Area, Page 5:** The text states that "Nearly all of the chemicals detected in Landfill Area soil at concentrations above RIECs were of a limited extent relative to the overall waste volume," but this statement gives the impression that areas where remedial investigation evaluation criteria (RIECs) were exceeded were actually examined to determine their size. This impression is incorrect, since most RIEC exceedences have not been investigated to determine the actual extent of high concentration contaminants.

2. **Section ES.2.3, Soil and Isolated Solid Waste in the Adjacent Areas, Pages 5 and 6:** In most of the remainder of the RI/FS, the Panhandle Area and East Adjacent Area are described separately. Use of this phrase is also confusing because the word "adjacent" is used to describe the East Adjacent Area and both areas together. For consistency, please delete the term "adjacent areas" and reference the specific area.

3. **Section ES.5.1, Remediation Goals, Page 11:** The text indicates that remediation goals for human receptors were derived for each contaminant of concern (COC) by comparing the highest concentrations of acceptable risk with both the laboratory's reporting limit and the ambient level for the COC, if one was established, but specific numeric goals are not included in the RI/FS except for total petroleum hydrocarbons (TPH) and the approach is not clearly explained. The remediation goals for total petroleum hydrocarbons also appear to be based in part on the distance from the shoreline. Please clarify specifically how the remediation goals were determined for each class of contaminants (PCBs, semi-volatile organic compounds [SVOCs], metals, etc.) and

provide the concentrations derived in this manner in a table for comparison with the RIECs and Region 9 preliminary remediation goals (PRGs).

4. **Section 1.2, Study Areas in Parcel E-2, Page 1-4:** Item 4 appears to be incomplete; please provide the missing text.

5. **Section 1.6.4.2, The East Adjacent Area, Page 1-10:** Although the text states that the area with PCB contamination was addressed under an interim removal action, portions of the PCB Hot Spot area have not yet been excavated. Please revise the text to incorporate this information.

6. **Figure 1-4, Surface Topography and Site Features:** This figure does not depict the current configuration of the shoreline and current elevations in the Metal Slag Area (MSA) or the current topography in the PCB Hot Spot excavation area. In addition, the figure does not include the drainage pipe that connects the drainage channel south of the interim landfill cap with the San Francisco Bay; this pipe is in the northwestern portion of the PCB Hot Spot excavation. Please provide an updated figure.

7. **Table 1-3, Summary of Previous Environmental Investigations and Remedial Activities in Parcel E-2, Page 7:** In addition to the area between the shoreline and the PCB Hot Spot Excavation, the area northwest of the excavation has not been excavated. The Regulatory Agencies requested that this area be included in the time critical removal action (TCRA) because of high concentrations of PCBs in shallow sediments adjacent to this area, but it was deleted when the excavation was scoped back. Please include this area in the sentence describing areas that still need to be excavated.

8. **Section 2.1.1, Landfill Area, Page 2-2 and Section 2.1.3, East Adjacent Area, Page 2-3:** Since 537 miscellaneous containers of apparent laboratory waste were removed from the PCB Hot Spot excavation, it is likely that laboratory waste is also present in the Landfill Area. Also, 110 drums were removed from the PCB Hot Spot, but the text does not include industrial waste in the description of the East Adjacent Area. Please include laboratory waste in the Landfill Area and both laboratory and industrial waste in the East Adjacent Area in the lists of wastes.

   It is also unclear why the only discussion of low level radiological waste is in the section describing the Panhandle Area when both the Landfill Area and portions of the PCB Hot Spot Area are considered radiologically impacted. Radioactive devices were removed from the PCB Hot Spot Excavation. Please revise the text of both sections to include a discussion of the likely presence of low level radiological waste in these areas.

9. **Section 2.1.4, Shoreline Area, Page 2-5:** Since the MSA excavation was completed, it is unclear why the slag is described as though it was still present. Please revise the text to state that the MSA excavation has been completed.

10. **Section 2.2.1.1, Artificial Fill and Undifferentiated Upper Sand Deposits – The A Aquifer, Page 2-7:** The text describes the A Aquifer as 5 to 15 feet thick, but in the

northern portion of Parcel E-2, the Bay Mud is absent, so the A and B Aquifers are contiguous. As a result, the apparent thickness of the A Aquifer appears to be as much as 50 feet. For consistency, since the previous section discusses the interconnection of the A and B Aquifers, please discuss the combined thickness of the aquifers in this section.

11. **Section 2.2.1.2, Bay Mud – The Aquitard; Figure 2-3, Cross-Section A-A'; and Figure 2-6, Cross-Section D-D':** The text states that fine grained sediments in the northwest corner of Parcel E-2 "isolate the uppermost portions of the B-aquifer (that are interconnected with the A-aquifer) from the lower portions of the B-aquifer," but this is not consistent with Figures 2-3 and 2-6, which indicate that the B Aquifer consists solely of sand in the northern portion of Parcel E-2. Please resolve this inconsistency.

12. **Section 2.2.4, Tidal Effects, Page 2-12 and Figure 2-19, Tidal Influence Study Wells and Parameters:** It is unclear why the TIZ does not include IR01MW400A and IR01MW38A, which have similar tidal efficiencies and fluctuations to wells that are included within the TIZ. Please include these wells within the TIZ and/or explain the criteria used to determine the extent of the TIZ in the text.

13. **xxx**

14. **Section 2.2.6.1, A-Aquifer Evaluation for Federal Criteria, Page 2-15:** Appendix I does not support the presumption that the cost to remove naturally occurring metals is prohibitive, as stated in Item 5. Please see comment on Section I4.1.8 and delete item 5 from Section 2.2.6.1.

15. **Section 2.2.6.1, A-Aquifer Evaluation for Federal Criteria, Page 2-15:** Item 6, the "[poor] quality of underlying B-aquifer relative to drinking water standards" appears to be contradicted by text in Section 2.2.6.2, which indicates that B aquifer groundwater has been included in the human health risk assessment (HHRA). Please delete item 6 or explain why it should be included.

16. **Section 2.2.6.4, Bedrock Water-Bearing Zone Evaluation, Page 2-16:** Since the former Albion Spring on Innes Street produced 10,000 gallons per minute from bedrock for bottling water and as a brewery, it is not clear why it is concluded that the bedrock water bearing zone is "not capable of yielding sustainable quantities of water." Please delete the quoted statement and revise the text to state that the quantity of water that can be produced from bedrock beneath Parcel E-2 is unknown.

17. **Section 2.3, Hydrology, Page 2-17 and Figure 2-22, Drainage Patterns and BMPs:** Neither the text nor the figure include the drainage pipe in the northwestern portion of the PCB Hot Spot excavation that connects the drainage channel south of the interim landfill cap with the San Francisco Bay. Please revise the figure to include this pipe.

    Since the PCB Hot Spot Area has been backfilled, the topography and drainage has changed. In addition, the blue arrows at the eastern and southeastern edge of the interim landfill cap should not cross the drainage swale at the base of the cap/slope. Please revise

the figure to include the current topography and drainage at the PCB Hot Spot and correct the arrows on the eastern and southeastern edge of the interim landfill cap.

18. **Figure 2-6, Cross-Section D-D' and Figure 2-13, Bay Mud Thickness Map:** Figure 2-6 indicates that Bay Mud is present in the vicinity if IR01MW05A, but this is not shown on Figure 2-13. Please resolve this discrepancy.

19. **Figure 2-10, Cross-Section H-H' and I-I':** It appears that this cross-section has not been updated to incorporate the MSA excavation and clean backfill. Please update the cross-section to incorporate the extent of the MSA excavation and clean backfill.

20. **Figures 2-14 through 2-16, A-Aquifer and B-Aquifer Groundwater Elevation:** It would be helpful to include the elevations used to create the contour maps and the TIZ on these figures. Please include the groundwater elevation values used to construct the contours and the TIZ on these figures.

21. **Figure 2-15, A-Aquifer Groundwater Elevations November 2004:** Depression contours should be used on Figure 2-15 in the vicinity of well IR12MW14A. Please use depression contours for areas below sea level that create a groundwater sink.

22. **Section 3.3.2, Standard Data Gaps Investigation (2002), Page 3-8 and Section 3.3.3, Characterization of Metal Slag Area (2004), Page 3-8:** The text indicates that the Draft Final RI/FS will be updated with confirmation sampling results from the removal actions conducted in these areas, so a summary of the types of debris encountered should also be included in the text of these sections to provide a more complete picture of the types of disposal that occurred in Parcel E-2. For example, at the PCB Hot Spot, 537 bottles and containers containing apparent laboratory waste and 110 drums were found; the types of waste and contents of the drums would provide insight into the types of industrial and laboratory waste that were disposed in Parcel E-2. Please include summaries of the types of debris that were removed from the PCB Hot Spot and MSA excavations. Please also include a summary of the materials contained in the drums.

23. **Section 3.8.3, Groundwater Extraction System and Containment Barrier (1997 to 1998), Page 3-22:** The text is written in present tense, which indicates that the groundwater extraction system still exists and can be brought back on-line, but all of the components of this system were removed during the PCB Hot Spot TCRA, so it will not be possible to bring the system back on-line. Please update the text to include the removal of this system.

24. **Section 3.8.5, Landfill Gas Removal Action (2002 to 2003):** There are more than the 5 gas monitoring probes (GMPs) mentioned in the text, since there are also a number GMPs on both sides of the gas collection trench and along Crisp Avenue, but these GMPs were apparently excluded from the text. Please revise the text to include a brief description of all GMPs associated with the landfill gas extraction system in the text.

    In addition, it is unclear why the text references Figure 1-3, which does not have all of

the GMP locations and does not reference Figure 3-7, which includes all of the components of the landfill gas extraction and control system and all of the GMP locations. Please revise Section 3.8.5 to discuss and reference Figure 3-7.

25. **Section 4.0, Nature and Extent of Solid Waste, Landfill Gas, and Chemicals in Soil:** The methodology used to screen and present PCB data is inconsistent. For example, the first complete paragraph on page 4-25 indicates that only the total PCB values will be described in detail, but this RIEC is based on the 2004 Industrial PRGs, which apply to individual Aroclor compounds as well as total PCBs. Therefore, each Aroclor mixture should be compared to its respective RIEC (21 mg/kg for low risk PCBs like Aroclor 1016 and 0.74 mg/kg for the high risk PCBs like Aroclor 1254). A number of Aroclors had maximum concentrations that exceeded the RIEC, but these detections exceeding the RIEC were not included in the summary of exceedences on the Section 4 tables. Please update the relevant Section 4 tables to reflect exceedences of individual Aroclor compounds, as well as for Total PCBs. Aroclors with concentrations that exceed the RIEC should be discussed in the text and included on figures.

    Also, it is inappropriate to use the Total PCB RIEC as a screening criterion for PCB congeners (e.g., PCB-008, PCB-052). Please re-evaluate the use of the Total PCB RIEC as a screening criterion, propose an alternate RIEC, and/or remove references to this RIEC from the Tables for PCB congeners.

    In addition, it is unclear how total PCB concentrations were obtained. Table 4-3 (Landfill Area, 0-2 feet) indicates the maximum total PCB concentration is 0.23 mg/kg, but the maximum Aroclor-1260 concentration is 20 J mg/kg. Further, Figure 4-56 indicates total PCBs were not reported above the RIEC, which is misleading given the elevated concentration of Aroclor-1260. Please discuss how the total PCB concentrations were derived and clarify how this maximum can be considered below the RIEC of 0.74 mg/kg when the Aroclor-1260 concentration is significantly above the RIEC. Also, please correct Tables 4-3 and 4-4 and Figure 4-56 to reflect Aroclor and total PCBs exceedences and discuss them in the text.

26. **Section 4.1.3.1, Soil Remedial Investigation Evaluation Criteria (RIEC):** It is unclear why the RIECs are based solely on human health when most of Parcel E-2 will be open space. Where possible, ecological criteria should be used to create RIECs. For example, the RIECs for shoreline sediment samples should be based on the effects-range medians (ERMs) for sediment. Shoreline sediment samples that exceed their respective ERMs but are below the selected RIECs for soil (such as copper) were omitted from the Figures in this RI/FS. Please revise the RI/FS to include revised RIECs for shoreline sediment that are based on the ERMs.

27. **Section 4.2, Landfill Area, Page 4-11 and Section 8.2.1.2, Operating History, Page 8-6:** The text in the third bullet in Section 4.2 and the first bullet in Section 8.2.1.2 indicates that the oily waste area was included within the boundaries of landfill solid waste, but based on test pit logs from the landfill lateral extent evaluation, areas in the vicinity of WE19C and WE20B with stained soil that was likely due to the disposal of

waste oil in this area are not included within the landfill boundaries (i.e., within the designated extent of solid waste). Please include these test pits within the boundary of solid waste or explain why they should be excluded.

28. **Section 4.2.4, Analytes Detected in Soils, Page 4-21; Section 4.3.2, Analytes Detected in Panhandle Area Soils (Excluding Metal Slag Area), Page 4-35; Section 4.4.2, Analytes Detected in East Adjacent Area Soils (Excluding PCB Hot Spot), Page 4-48:** RIEC exceedences are described as limited in extent and not indicative of a hot spot, but the Navy has proposed not to characterize any more hot spots, on the basis that EPA guidance states that waste characterization is not necessary. Please identify locations where the detected concentration exceeded the RIEC by a factor of 10 as a data gap and recommend minimal investigation (e.g., 3-5 new samples) at high concentration sample locations prior to or during remedial design for alternatives that involve complete excavation or removal of hot spots.

29. **Section 4.2.4.1 Landfill Area Surface Soils (0 to 2 feet), Page 4-21; Table 4-3, Summary of Analyses and Detections in the Landfill Area (0-2 feet), Page 2:** The last paragraph on page 4-21 states that none of the laboratory reporting levels (LRLs) for benzo(a)anthracene exceeded the selected RIEC of 1.3 mg/kg. However, Table 4-3 indicates the range of LRLs for benzo(a)anthracene was 0.073 to 1.5 mg/kg. Please resolve this discrepancy. There are similar issues with benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and other chemicals. Please review the text and Table 4-3 and resolve any other inconsistencies where the LRLs exceeded RIECs.

30. **Section 4.2.4.2, Landfill Area Subsurface Soils (2 to 10 feet), Page 4-25:** The second complete paragraph on page 4-25 indicates there are two PCB hotspots within the landfill (IR01B001, 9.41 feet bgs, 284 mg/kg, and IR01MW16A, 8.75 feet bgs, 740 mg/kg), but one additional PCB hot spot (IR01MW05A, 8.31 feet bgs, 370 mg/kg) was not mentioned in the text. Please include this hot spot in the discussion of total PCBs.

31. **Section 4.2.4.2, Landfill Area Subsurface Soils (2 to 10 feet), Page 4-25:** 1,4-dichlorobenzene is present in the landfill area at a maximum concentration of 59 mg/kg, which exceeds the RIEC (0.13 mg/kg) and 100 times the RIEC, which is used to define a hot spot, but the text states that this concentration is not indicative of a hot spot. Similarly, naphthalene also was reported at a maximum concentration (1400 mg/kg) that exceeds 100 times the RIEC (1.5 mg/kg), but was not considered a hot spot. In addition, naphthalene exceeded the RIEC in 11 locations, not the single location mentioned in the text. Please revise the text to include the 1,4-dichlorobenzene and naphthalene hot spots and correct the text to cite the correct number of naphthalene exceedences.

32. **Section 4.2.4.3 Landfill Area Deep Soils (greater than 10 feet), Page 4-33:** The last sentence in second complete paragraph (Petroleum Hydrocarbons) on page 4-33 refers to xylenes (total) but should refer to TPH. Please correct this sentence.

33. **Section 4.3.2.1, Panhandle Area Surface Soils (0-2 feet), Page 4-37:** The text does not acknowledge that samples have not been collected east or south of IR01B372 where total PCBs were found at 20 mg/kg. Please revise the text to include this information.

34. **Section 4.3.2.2, Panhandle Area Surface Soils (2-10 feet), Page 4-40:** This section appears to have been titled incorrectly since subsurface contamination is discussed in the text.

35. **Section 4.4.2.1, East-Adjacent Surface Soils (0-2 feet), Pages 4-49 to 4-51:** The extent of contamination has not been delineated because samples have not been collected to define the following:

    Arsenic: samples have not been collected west of IR04B030
    Lead: samples have not been collected west or northwest of IR04B047
    Dieldrin: samples have not been collected southwest of IR12B041
    Total PCBs: samples have not been collected southwest of IR12B042
    Various polynuclear aromatic hydrocarbons (PAHs): samples have not been collected north of IR01TA06B.

    Please revise the text to include this information.

36. **Section 4.4.2.2, East-Adjacent Subsurface Soils (2-10 feet), Page 4-53:** Similarly, the extent of total PCBs has not been bounded to the southwest of IR01TA07A. Please revise the text to include this direction.

37. **Section 4.5.3, Nature and Extent of Soil Contamination, Page 4-61 and Section 8.4.2, Nature and Extent of Chemicals in Soil, Page 8-19:** In order to support the conclusions in these sections, the number of borings and number of samples collected in each area should be compared to the number of locations/samples with exceedences. For example, it cannot be concluded that there is less contamination in the East Adjacent Area at depths below 10 ft bgs (page 8-19) than in other areas without considering the number of samples collected below 10 ft bgs in each area. Please include a comparison of the number of samples collected in each area and at specific depths with the number of exceedences (e.g., as listed in Table 4-24) into these sections.

38. **Section 4.5.3, Nature and Extent of Soil Contamination, Page 4-61:** The third bullet notes that 6 samples from the Panhandle Area exceeded more than 100 times the PCB RIEC, but only classifies the sample locations as "potential hot spots" with no further action planned. According to the definition in Section 4.2.4, exceedences 100 times the RIEC qualify as hot spots, not "potential" hot spots. Please revise the text to identify the six locations as hot spots, and provide appropriate sampling plans to determine contaminant distributions in these areas.

39. **Section 4.5.3, Nature and Extent of Soil Contamination, Page 4-62, and Section 4.5.4, Data Gaps, Page 4-63:** As discussed in Section 4.5.3 and shown on Table 4-24, RIEC exceedences in the Panhandle and East Adjacent Areas are not completely

delineated. The text states that it is difficult to delineate potential point sources of soil contamination due to the heterogeneous nature of fill material and that adequate data exists to evaluate potential human health and ecological risks at Parcel E-2. Section 4.5.4 further states that further delineation is not necessary based on the focused remedial alternatives presented in this FS. While the data may be sufficient to proceed with the RI/FS process, this does not preclude the need for future sampling to completely delineate the extent of soil and groundwater contamination for alternatives that involve excavation. Please revise the text to state that delineation of the extent of contamination is not necessary for capping alternatives, but that additional delineation may be necessary for alternatives that involve excavation (i.e., either complete excavation or hot spot removal).

40. **Figure 4-8, Naphthalene in 0-2' Soil; Table 4-3, Summary of Analyses and Detections in the Landfill Area (0-2 feet), Page 2; and Section 4.2.4.1 Landfill Area Surface Soils (0 to 2 feet), Page 4-22:** Several locations where concentrations are reported as non-detects on Figure 4-8 had reporting limits that are significantly above the RIEC for naphthalene of 1.5 mg/kg. For example, the samples from IR01B390 at 2 feet bgs and IR72SS22 at 0 feet bgs are reported as not detected above the reporting limit of 10 mg/kg. However, the reporting limit range on Table 4-3 is presented as 0.073 mg/kg to 1.5 mg/kg, and the text on page 4-22 states that none of the reporting limits for naphthalene exceeded the selected RIEC. Please clarify these discrepancies and review all figures, tables, and text for similar inconsistencies.

41. **Table 4-1, Summary of Human Health Evaluation Criteria for Soil:** It is unclear why some of the RIEC values are not the lowest listed criterion. For example, the 2004 Industrial PRG for endrin is listed as 180 mg/kg, but the RIEC is 190 mg/kg. Similarly, the 2005 Industrial Environmental Screening Level (ESL), Inhalation for 2,4,5 trichlorophenol is 305 mg/kg and for pyrene is 425 mg/kg, but the RIECs are 310 mg/kg and 430 mg/kg, respectively. Please resolve these discrepancies.

42. **Table 4-24, Summary of Soil Exceedences of Evaluation Criteria:** The text on page 4-62 indicates that RIEC exceedences are shown in red text on this table, but there is no red text. Please resolve this discrepancy.

43. **Table 4-25, Resolution of Data Quality Objectives, Parcel E-2 Soil and Sediment:** The third column in the "Nature and Extent of Contamination in Parcel E-2 Shoreline Sediment" indicates the Shoreline Characterization Technical Memorandum is found in Appendix A. This memorandum is found in Appendix G. Please revise the text to cite the correct Appendix.

44. **Table 4-25, Resolution of Data Quality Objectives, Parcel E-2 Soil and Sediment Page 1:** The fifth Decision Question (DQ) under "Nature and Extent of Contamination in Onshore Soil" and its resolution are problematic. First, the DQ itself is vague since it does not specify how a TPH plume is defined. Based on the criteria for PCBs in groundwater (any detected concentrations), it could be assumed that TPH detections above reporting limits are considered part of the TPH plume, but this should be clarified.

Second, it is unclear why PCB concentrations in soil are not included along with soil concentrations of TPH when investigating the sources of TPH and PCB groundwater contamination. PCB concentrations in soil should be considered for this DQ.

Third, the resolution of the DQ states that source areas and single point locations suspected to be within TPH plumes or locations where PCBs have been detected in groundwater do not have soil concentrations of TPH that exceed criteria, but this conclusion is not supported by the data. PCB and TPH data were not collected from the screened interval of each monitoring well boring, so it is difficult to correlate soil and groundwater data. For example, IR01B011, where TPH in soil exceeds the RIEC (11,360 mg/kg at 9 feet bgs and 9,360 mg/kg at 11 feet bgs), does not have a corresponding groundwater sampling location. Therefore, it is unclear whether groundwater in this location has been impacted. Similarly, Figure 5-64 indicates only two wells (IR01MWI-3 and IR01MW43A) have TPH concentrations (in groundwater) above the RIEC. These locations are within the PCB Hot Spot area and were likely excavated to at least 10 feet bgs. However, soil data is unavailable for well IR01MWI-3, so the conclusion that concentrations of TPH did not exceed the RIEC cannot be made.

Also, Figure 4-56 does not include all PCB exceedences in the 0-2 feet bgs soils. Because the location of the maximum exceedence (20 mg/kg) is not identified, it is not possible to evaluate TPH and PCB concentrations in nearby groundwater sampling locations. In addition, groundwater sampling locations do not exist for every RIEC exceedence of PCBs in soil. For example, PCBs were detected at concentrations above the RIEC in locations IR01B373, IR01B374, IR01B386, IR01B390, and IR01B394 at 0-2 feet bgs. Samples were not analyzed for PCBs in these locations at greater depths. Groundwater samples were collected from locations IR01MW53B and IR01MW48A (which correspond roughly to soil sampling locations IR01B373 and IR01B374); however, the reporting limits for these samples exceeded the RIEC for PCBs. Similar issues exist for PCB hot spots identified in the landfill. Therefore it is premature to conclude that locations where PCBs have been detected in groundwater do not have corresponding soil concentrations that exceed the RIEC, or vice versa. Please revise the text and Table 4-25 to delete such conclusions.

45. **Section 4, Figures:** Soil sampling locations in the PCB Hot Spot area are not included on the figures, perhaps because soil was excavated in this area. However, soil samples with PCB concentrations exceeding the RIEC of 0.74 mg/kg were collected at depths greater than the PCB Hot Spot excavation depths. In addition, at least 4 sample locations/borings were not excavated when the excavation boundaries were changed. These soil samples should be included on the appropriate figures. Please include any soil samples from depths greater than those excavated and also include the 4 locations that were not excavated on the Figures.

46. **Section 5.3.2.2, Previous LNAPL Evaluations, Page 5-9:** Although the text states that the extraction of more than three million gallons of groundwater and surface water from the PCB Hot Spot excavation "removed all remaining traces of LNAPL," excavations

southwest of the PCB Hot Spot area and between it and the shoreline indicate that light non-aqueous phase liquid (LNAPL) is still present in the shoreline area. Please revise the text to include this information.

47. **Section 5.4, Hunters Point Groundwater Ambient Levels, Page 5-12:** The statement in the second sentence, "Because the presence of metals in groundwater does not constitute contamination," should be revised to state that the presence of naturally occurring metals at background concentrations does not constitute contamination. This will clarify the difference between naturally occurring metals in groundwater and groundwater that has been impacted by metals contamination.

48. **Section 5.5, Chemical Limits and Standards, Page 5-13:** Groundwater samples should also be compared to the California Toxics Rule (CTR) criteria and to the national ambient water quality criteria (NAWQC). If these are contained within the Regional Water Board's ESLs, then that should be stated.

49. **Section 5.7.2, Graphical Data Analysis Results:** There are a number of discrepancies between the tables, text and figures in Section 5, which are summarized below:

Figure	Table	Text	Issues
Figure 5-1	--	Section 5.7.2.1, Page 5-16	The text states that cyanide was detected above the RIEC in only 1 perimeter well after 2002. Figure 5-1 indicates that cyanide was detected above the RIEC in 2 wells, IR01MWLF-4B and IR01MW47B in December 2004.
Figure 5-2	--	Section 5.7.2.1, Page 5-17	The text states un-ionized ammonia exceeded the RIEC in 6 of 14 perimeter wells, but Figure 5-2 indicates that the RIEC was exceeded in 8 perimeter wells.
Figure 5-3	Table 5-1	Section 5.7.2.2, Metals, Page 5-17	Table 5-1 indicates the maximum concentration of nitrite in the A-aquifer was 59,000 micrograms per liter (ug/L). This exceedence is not shown on Figure 5-3 nor is it discussed in the text.
Figure 5-4	Table 5-2	Section 5.7.2.2, Metals, Page 5-17	Table 5-2 indicates the maximum concentration of aluminum in the A-aquifer was 183,000 ug/L. This exceedence is not shown on Figure 5-4 nor is it discussed in the text.
Figure 5-7	--	--	Several entries under well IR01MW48A are printed in red, indicating these concentrations exceed the RIEC, when they do not.
Figure 5-13	--	Section 5.7.2.2, Metals, Page 5-20	The text states that copper was detected in all but 3 wells at the site. Figure 5-13 shows that copper was not detected in 12 wells. The text states that copper was detected above the RIEC in 5 B-aquifer wells. Figure 5-13 shows copper was detected above the RIEC in6 B-aquifer wells
Figure 5-14	--	Section 5.7.2.2, Metals, Page 5-21	The text states that lead was detected in all but 4 wells at the site. Figure 5-14 shows that lead was not detected in 9 wells.
Figure 5-16	--	Section 5.7.2.2, Metals, Page 5-21	The text states that mercury was detected above the RIEC in 9 A-aquifer wells. Figure 5-16 shows mercury was detected above the RIEC in 8 A-aquifer wells and 1 B-aquifer well.
Figure 5-17	--	Section 5.7.2.2, Metals, Page 5-22	The text states that nickel was detected in all but 4 wells. Figure 5-17 shows that nickel was not detected in six wells. The A-aquifer RIEC is described in the text as 36.48 ug/L, but Figure 5-17 indicates the RIEC is 96.5.

Figure	Table	Text	Issues
Figure 5-20	--	Section 5.7.2.2, Metals, Page 5-23	The text states that vanadium was detected in all but 3 wells. Figure 5-20 shows that vanadium was not detected in 4 wells.
Figure 5-21	--	Section 5.7.2.2, Metals, Page 5-23	The text states that zinc was detected in all but 10 wells at the site. Figure 5-21 shows that zinc was not detected in 17 wells. Figure 5-21 indicates zinc was detected above the RIEC in 14 A-aquifer wells, not 13 as stated in the text.
Figure 5-22	Table 5-3	--	Table 5-3 indicates 4,4'-DDD was detected in the A-aquifer at a range of 0.012 ug/L to 0.028 ug/L. Figure 5-22 indicates the range of 4,4'DDD was 0.0064 ug/L to 0.022 ug/L in well IR01MW38A. Figure 5-23 (4,4'-DDE in Groundwater) presents these same concentrations for well IR01MW38A, suggesting Figure 5-22 may present incorrect data.
Figure 5-34	Table 5-3	Section 5.7.2.3, PCBs and Pesticides, Page 5-27	Table 5-3 indicates the range of heptachlor epoxide detections in the A-aquifer was 0.009 ug/L to 0.066 ug/L. Figure 5-34 indicates the concentration range was 0.008 ug/L to 0.049 ug/L. Also, Figure 5-34 indicates there were 4 detections that exceeded the RIEC, not 3 as specified in the text.
Figure 5-36	--	Section 5.7.2.4, SVOCs, Page 5-28	The text states that anthracene was detected in well IR01MW26A but Figure 5-36 shows that anthracene was detected in well IR01MW62A
Figure 5-42	--	Section 5.7.2.4, SVOCs, Page 5-29:	The text states that bis(2-ethylhexyl)phthalate was detected in 5 wells, but Figure 5-42 does not include detections in the 4 listed A-aquifer wells.
Figure 5-43	--	Section 5.7.2.4, SVOCs, Page 5-30	The text states that chrysene was detected above the RIEC in 7 A-aquifer wells. Figure 5-43 shows chrysene was detected above the RIEC in 5 A-aquifer wells.
Figure 5-45	--	Section 5.7.2.4, SVOCs, Page 5-30	The text states that fluoranthene was detected in 7 wells, but only wells IR01MWI-3 and IR01MWI-5 are depicted with detections on Figure 5-45.
Figure 5-65	--	Section 5.7.2.4, SVOCs, Page 5-31	The text states that fluorene was detected in 10 wells, but only 4 wells are shown with detections on Figure 5-65.
Figure 5-47	--	Section 5.7.2.4, SVOCs, Page 5-31	The text states that 2-methylnaphthalene was detected in ten wells, and eight wells had detections above the RIEC. Figure 5-47 shows nine wells with detections above the RIEC, and no wells with detections that were above reporting limits but below the RIEC.
Figure 5-48	--	Section 5.7.2.4, SVOCs, Page 5-31	The text states that naphthalene was detected in 17 wells; however, Figure 5-48 shows 8 E-2 wells that had detections.
Figure 5-49	--	Section 5.7.2.4, SVOCs, Pages 5-31 and 5-32	The text states that phenanthrene was detected in 9 A-aquifer wells and 1 B-aquifer well; however, Figure 5-49 shows four wells (3 A-aquifer wells and 1 B-aquifer well) that had detections.
Figure 5-51	--	Section 5.7.2.5, VOCs, Pages 5-33	The first complete paragraph on page 5-33 indicates 4 A-aquifer wells are located along the western and eastern edges of Parcel E-2, but well IR01MW31A is mentioned twice. It appears that one instance of IR01MW31A should be replaced with IR04MW31A.
Figure 5-53	Table 5-5	--	Table 5-5 indicates the maximum concentration of 1,4-dichlorobenzene detected in A-aquifer groundwater was 12 ug/L. Figure 5-53 shows the maximum concentration of 1,4-dichlorobenzene was 16 ug/L.
Figure 5-54	--	Section 5.7.2.5, VOCs, Page 5-34	The text states that 1,1-dichloroethane was detected in 6 A-aquifer wells. Figure 5-54 shows 4 wells within the E-2 boundaries with 1,1-dichloroethane detections.

Figure	Table	Text	Issues
Figure 5-56	--	Section 5.7.2.5, VOCs, Page 5-35	The text states that 1,2-dichloroethane was detected in 5 wells. Figure 5-56 only shows 2 wells with 1,2-dichloroethane detections.
Figure 5-57	--	Section 5.7.2.5, VOCs, Page 5-35	The text states that cis-1,2-dichloroethene was detected in 17 wells at Parcel E-2. Figure 5-57 shows 4 wells within Parcel E-2 boundaries with cis-1,2-dichloroethene detections.
Figure 5-59	--	Section 5.7.2.5, VOCs, Pages 5-35 and 5-36	The text states that tetrachloroethene was detected in 9 wells. Figure 5-59 shows five wells within Parcel E-2 boundaries and 3 wells outside the boundaries with tetrachloroethene detections.
Figure 5-61	--	Section 5.7.2.5, VOCs, Page 5-36	The text states that trichloroethene was detected in 14 wells. Figure 5-61 shows 5 wells with trichloroethene detections within E-2 boundaries and 4 wells outside E-2 boundaries.
Figure 5-62		Section 5.7.2.5, VOCs, Page 5-36	The text states that vinyl chloride was detected in 3 wells. Figure 5-62 shows 2 wells with vinyl chloride detections.
Figure 5-63		Section 5.7.2.5, VOCs, Page 5-37	The text states that xylenes were detected in 19 wells. Figure 5-63 shows 12 wells within or adjacent to E-2 boundaries with xylenes detections.
Figure 5-64		Section 5.7.2.5, VOCs, Page 5-37	The text states that TPH was detected in all but 7 wells. Figure 5-64 shows that TPH was detected in all but 11 wells within the E-2 boundaries.

50. **Section 5.7.2, Graphical Data Analysis Results:** In some cases, the highest detection limit exceeds the RIEC by one or more orders of magnitude. Further, based on quarterly monitoring data, the detection limits for some metals, PCBs, and pesticides have not been low enough to detect concentrations at or below the most conservative screening criteria. As a result, the nature and extent of contamination has not been delineated. Please see the table below for chemicals of concern that have detection limits that are higher than screening criteria and discuss how and when this data gap will be resolved.

Chemical	Detection Limit[a]	Most Conservative Criterion
Un-ionized ammonia	1750 ug/L[b]	25 ug/L
PCBs (total)	0.5 ug/L	0.014 ug/L
Mercury	0.2 ug/L	0.012 ug/L
Copper	50 ug/L[b]	3.1 ug/L
Lead	320 ug/L[b]	2.5 ug/L
Cyanide	10 ug/L[b]	1 ug/L
4,4-DDD	0.01, 10 ug/L[b]	0.001 ug/L
4,4-DDE	0.01, 5 ug/L[b]	0.001 ug/L
4,4-DDT	0.01, 5 ug/L[b]	0.001 ug/L
Alpha-Chlordane	0.005, 25 ug/L[b]	0.004 ug/L
Dieldrin	0.01, 5 ug/L[b]	0.0019 ug/L
Endosulfan II	0.01, 5 ug/L[b]	0.0087 ug/L
Endrin	0.01, 5 ug/L[b]	0.0023 ug/L
Gamma BHC (Lindane)	3 ug/L[b]	0.016 ug/L
Gamma –Chlordane	0.005, 25 ug/L[b]	0.004 ug/L
Heptachlor	0.005, 3 ug/L[b]	0.0036 ug/L
Heptachlor Epoxide	0.005, 3 ug/L[b]	0.0036 ug/L
Benzo(a)anthracene	1, 100 ug/L[b]	0.027 ug/L

Chemical	Detection Limit[a]	Most Conservative Criterion
Benzo(b)fluoranthene	1, 100 ug/L[b]	0.029 ug/L
Benzo(k)fluoranthene	1, 100 ug/L[b]	0.029 ug/L
Benzo(a)pyrene	1, 100 ug/L[b]	0.014 ug/L
Benzo(g,h,i)perylene	1, 100 ug/L[b]	0.1 ug/L
Chrysene	1, 100 ug/L[b]	0.29 ug/L
Dibenz(a,h)anthracene	1, 100 ug/L[b]	0.0085 ug/L
Indeno(1,2,3-cd)pyrene	1, 100 ug/L[b]	0.029 ug/L

a The value listed is the minimum detection limit for non-detected results unless otherwise indicated.

b The maximum detection limit is listed.

51. **Section 5.7.2, Graphical Data Analysis Results:** For several metals, the text concludes that metals concentrations have not persisted in groundwater over time or that concentrations of a certain metal no longer exceed the RIEC, but the factors that impact metals concentrations in groundwater in the vicinity of a landfill were not considered. Changes in metal concentrations in groundwater or leachate can occur due to source depletion or because of changes in groundwater geochemistry; sampling artifacts and variations in sampling procedures could also be responsible for observed concentration changes. Metals do not degrade over time and would be expected to be present in groundwater unless a source is depleted. Changes in groundwater geochemistry that are likely in the vicinity of a landfill cause metals to dissolve or to precipitate out. For example, nickel is highly mobile and does not readily sorb to most materials whereas the mobility of copper is controlled by mobile (i.e., soluble) or immobile organics until the organic source is depleted. In addition, in a saline environment, groundwater chemistry associated with the landfill materials will change over short distances, causing inorganic constituents to dissolve or precipitate out. With regard to sampling artifacts, changes in sampling procedures like reducing the flow rate or using different batches of filters may result in varying metals concentrations. For example, a filter is a polymer web designed not to pass a certain particle size and over which there is uncertain quality control during manufacturing so different batches of filters may filter out smaller particles than specified by the filter size. Since some metals are subject to facilitated transport when sorbed to colloids and dissolved organics, different batches of filters may result in apparent decreases in metals concentrations. Therefore, conclusions that metals are not persistent or that concentrations no longer exceed the RIEC based on a single round of groundwater sampling should be deleted from the text. Please do not draw conclusions based on results from a single sampling round. Also, delete general statements about apparent reductions in concentrations from the text or revise the text to include better rationale for why the metal concentrations appear to have decreased.

52. **Section 5.7.2.2, Metals, Page 5-21:** The text attributes the detections of mercury in IR01MW366A groundwater to landfill waste, but the boring log indicates that this well was screened across Bay Mud. Please either explain why landfill waste is a factor or delete the statement about the location of this well.

53. **Section 5.7.2.3, PCBs and Pesticides, Pages 5-23 through 5-27:** The text indicates the extent of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha chlordane, PCBs, dieldrin, endosulfan I, endosulfan II, endrin, gamma-BHC, gamma-chlordane, heptachlor, and heptachlor epoxide contamination in groundwater has been adequately delineated by concentrations below RIECs. However, the reporting limit exceeds the RIEC in a number of samples analyzed for these compounds. Please revise the text to indicate the extent of contamination of these compounds has not been delineated due to these elevated reporting limits.

54. **Section 5.2.7.4, SVOCs, Pages 5-27 through 5-32:** The reporting limits (RLs) for a number of SVOCs exceed the RIECs for these compounds, including anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, phenanthrene, and pyrene. It is therefore premature to state that the extent of these compounds in groundwater is adequately delineated by concentrations below RIECs. Please revise the text to indicate the extent for contamination of these compounds has not been delineated due to elevated RLs.

55. **Section 5.2.7.5, VOCs, Pages 5-33 through 5-37:** It is unclear whether the extent of carbon tetrachloride, 1,4-dichlorobenzene, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, and vinyl chloride in groundwater is adequately defined, as stated in the text, because the information presented on their respective figures indicates the reporting limits for these compounds exceeded the RIECs at a number of sampling locations. Please revise the text to indicate the extent of contamination for these compounds has not been delineated due to elevated reporting limits.

56. **Section 5.8.1, Summary of Lateral and Vertical Extent, Page 5-39:** The text of the first bullet on page 5-39 attributes metals concentrations in groundwater to ambient concentrations rather than past site activities, but there is no justification for this conclusion. Given the tendency of metals to sorb to colloids and organics, and the potential that batch-related variations in filter material may have resulted in screening out metals when it is likely that facilitated transport of metals sorbed to colloids and organics is occurring. Further, the detection of elevated concentration of some metals (e.g., antimony, cadmium, chromium VI, copper, lead, mercury, and zinc) in groundwater beneath the landfill, adjacent to the landfill, or in areas where construction debris and other wastes were disposed in the rest of the parcel suggests that former waste disposal practices resulted in elevated concentrations of metals in groundwater. Please delete the text of the bullet attributing metals in groundwater to ambient conditions or provide a detailed justification based on geochemistry and the behavior of individual metals beneath and in proximity to landfill and other buried wastes and in a saline environment.

57. **Section 6.1, Potential Sources of Contamination, Page 6-2:** The 110 drums and 537 containers of laboratory waste found at the PCB Hot Spot Area or the 5 drums of waste found during excavation of the MSA are sources of contamination that should be acknowledged in this section. Since it is likely that drums, which deteriorate and release contaminants to soil and groundwater, may be present in the rest of the East Adjacent and

Panhandle Areas, the likely presence of drums should be discussed in this section. Please revise the text to include this information.

58. **Section 6.2.2, Subsurface Air/Landfill Gas, Page 6-4:** Although the text states, "No other landfill gas concentrations monitored in and around Parcel E-2 were detected at levels of concern," hazardous levels of methane have been detected in monitoring wells on the landfill and in well and utility vaults in the PCB Hot Spot Area. Groundwater sampling forms indicate that several wells on the landfill could not be sampled because high levels of methane were detected when the well cap was removed. Similarly, the landfill gas reports indicate that methane was detected at 15.1 percent by volume in at least one well or utility vault in 2004, and that methane was detected in several vaults in 2005. Please revise the quoted statement to clarify that hazardous levels of methane have been detected in wells located within the landfill boundary and in former vaults in the PCB Hot Spot Area.

59. **Section 6.3.1.3, Groundwater, Pages 6-7 and 6-8:** The groundwater discussion for the A aquifer should discuss discharge to the bay and ecological risk. The text should indicate that groundwater in Parcel E-2 is considered Class II under Federal guidelines, but then go on to reference the beneficial use analysis and that the Navy is proposing to not apply drinking water standards to the aquifer. In addition, it should be noted that the Basin Plan has not been amended, so the RWQCB determination should only be considered provisional.

60. **Section 8.2.1.3, Nature and Extent of Chemicals in Soil, Page 8-7:** The third paragraph on page 8-7 states that PCBs do not appear to have migrated to groundwater beneath the landfill, based on groundwater monitoring results that indicated PCBs were either not detected above reporting limits, or were detected sporadically. However, the detection limits are approximately two orders of magnitude above California Toxics Rule level for PCBs.

    Further, A-aquifer monitoring well IR01MW16A had elevated PCB concentrations in 1992, PCB concentrations below reporting limits (but the reporting limits exceeded the RIEC) in 2002, and no groundwater data since 2002. IR01MW16A is also the location of a PCB hotspot in soil, with PCB concentrations of 250 mg/kg at 11.25 feet bgs. Additional groundwater data from this location is needed before the conclusion can be made that PCBs are not migrating from soil to groundwater. Please delete the conclusion that PCBs are not migrating to groundwater in hot spot areas and recommend collection of groundwater samples from IR01MW16A to provide current data for this area.

61. **Section 8.2.1.3, Nature and Extent of Chemicals in Soil, Page 8-7:** There is another unexcavated source of PCBs, northwest of the PCB Hot Spot Area that appears to be a current ongoing source of PCBs to shoreline and offshore sediment, based on Parcel F data. This location has been a source of high concentrations of PCBs for some time, based on the finding of PCBs greater than 5000 ug/kg in offshore sediment from the surface to 2.5 feet below the sediment/water interface, but the source in Parcel E-2 has not yet been found. Since water in this area is quiescent and there is no long fetch for

waves to build up and PCBs have been covered by sediment in other areas, there must be an ongoing source.

62. **Section 8.2.2.1, Human Health Risk Assessment, Page 8-9:** There is a discrepancy in the number of cells described in the first paragraph, since the third sentence states, "of the remaining 44 grid cells, 12 grid cells did not exceed any risk thresholds and 34 grid cells contained no data." It is unclear if there are 44 or 46 grid cells.

63. **Section 8.2.3.1, Conclusions for Overall Landfill Characterization, Page 8-11:** In the second bullet, landfill solid waste volume is estimated as 710,000 cubic yards. This contradicts the volume estimate of 473,000 cubic yards stated in Section ES.2.1, Section 8.2.1.5, and elsewhere and different from the 1,008,250 cy listed in Step 5 on Page 8-14. Please provide a consistent estimate throughout.

64. **Section 8.2.3.1, Conclusions for Overall Landfill Characterization, Page 8-12:** Some munitions and explosives of concern (MEC) related waste items were found during the excavation of the PCB Hot Spot and possibly at the MSA. The types of these items should be summarized in this section.

65. **Section 8.2.3.4, Application of the Containment Presumptive Remedy, Pages 8-13 and 8-14:** It is unclear why focused removals have not been considered. The answer provided to the question in Step 5 (Is excavation of contents practical?) is negative, due in part to the large removal proposed (more than a million cubic yards). Removal of relatively small hot spots could be practical, especially considering potential future liability for unknown wastes that may migrate outward from the landfill and adjacent areas. Leaving most of the non-hazardous wastes in place would also reduce or eliminate the need to import large volumes of backfill soil. Please consider the feasibility of a focused hot spot removal program prior to cap construction.

66. **Section 8.3.1, Landfill Gas Characterization, Page 8-15:** It is unclear why the text of the last paragraph of this section states that "the extent of landfill gas was determined to be at the northern edge of the UCSF compound" and that "[t]o the east, west, and south, landfill gas had not migrated beyond the perimeter of the Parcel E-2 landfill," since there have been at least 15 detections of landfill gas in the well and utility vaults in the PCB Hot Spot Area between March 2003 and September 2005 at concentrations ranging from 0.1 to 15.1 percent by volume. Please revise the text to incorporate this information or to explain the basis for the quoted statements.

67. **Section 8.4.1, Nature and Extent of Isolated Solid Waste Locations, Page 8-18:** The description of the solid waste in the Panhandle and East Adjacent areas (first paragraph) and in the PCB Hot Spot Area (last paragraph) should include the drums found in the Panhandle and East Adjacent areas and the 537 containers of laboratory waste found at the PCB Hot Spot Area. Also, clothing, which should be considered putrescible, was found in the first 2 or 3 feet at the PCB Hot Spot area. Please revise the text to include this information.

68. **Section 8.4.2, Nature and Extent of Chemicals in Soil, Page 8-19:** It is unclear why the second bullet only acknowledges PCBs exceeding the RIEC to a depth of 10 feet bgs when the PCB Hot Spot excavation was extended below 10 feet in some areas because PCBs were detected in confirmation samples.

69. **Section 8.6, Surface Water, Page 8-28:** The statement, "Results to date indicate that surface water discharges from the Parcel E-2 Landfill do not pose an unacceptable risk to aquatic receptors in the Bay," is not supported by the results of the 2005-2006 sampling when total dissolved solids, specific conductance, and several metals exceeded discharge limits, NAWQC, and the CTRs. Please revise the text to incorporate this information and delete the quoted statement.

70. **Figure 8-1, Application of Containment Presumptive Remedy:** It is unclear why the second bullet under "Monitoring Data" in Box 1 states that PCBs "showed little potential to migrate" when high levels of PCBs have been found in shoreline and offshore sediments at depths ranging from the sediment surface to 2.5 feet below the sediment-water interface. Given the presence of PCBs at the surface in near shore sediment, it appears that there is an ongoing source north-northwest of the PCB Hot Spot excavation that has not yet been located. Since a smear zone along the shoreline does not exist, the PCB Hot Spot is not the source of this contamination.

71. **Section 12, Development of Remedial Alternatives:** The text refers to "adjacent areas" in several cases when the Panhandle is being described. For example, the last sentence of the description of Alternative 2 on page 12-1 indicates that wetlands would be mitigated in "the adjacent areas," but the wetlands restoration will occur in the Panhandle Area. Since the nomenclature "Panhandle Area" and "East Adjacent Area" are used throughout the remainder of the RI/FS to refer to the specific areas designated on Figures 1-2 and 11-1, please replace all occurrences of the phrase "adjacent areas" with the specific area designation.

72. **Section 12.2.2, Alternative 2 and Figure 12-11, Proposed Excavation Depths, Alternative 2:** Much of the PCB Hot Spot excavation was 10 or more feet deep, so it is unclear why excavation of the remaining wastes to the west and southwest of this area is proposed for a depth of 2.5 to 3 feet, particularly since most of the ridge along the shoreline has not yet been removed. Drums were found in this ridge, so excavation of the entire ridge is necessary. In addition, the PCB Hot Spot excavation was truncated, so Figure 12-11 should be revised to include the areas that have not yet been excavated. Please use the PCB Hot Spot excavation boundaries and depths to revise the proposed extent and depth of excavation shown on Figure 12-11 and adjust the excavation volume and costs to reflect these changes.

73. **Section 12.2.3, Alternative 3: Page 12-13:** Alternative 3 should also include excavation of the remaining PCB-contaminated wastes west, southwest, and north of the PCB Hot Spot excavation. Parcel F data indicates that the area north of the PCB Hot Spot excavation is an ongoing source of PCBs to near shore sediment. It appears that Appendix R includes some costs for PCB excavation and disposal, but it is not clear that

the volumes and costs include the area north of the PCB Hot Spot (i.e., west of the landfill), since the cost estimate specifies this would occur southwest of the landfill. Please revise the description of this alternative to include limited excavations for removal of PCBs west, southwest, and north of the PCB Hot Spot excavation and revise the costs to include the excavation and disposal of PCB-contaminated material north of the PCB Hot Spot Area.

74. **Section 12.2.3, Alternative 3, Page 12-13 and Section 14.0, Comparative Evaluation of Remedial Alternatives, Page 14-1:** Figure 14-1 includes shoreline remediation in Alternative 2, but not Alternative 3. Alternative 3 appears to assume that a cap could be constructed on the outboard shoreline. Due to the soft character of the saturated shoreline sediments, and the high contaminant concentrations in these sediments, placement of a cap may be extremely difficult and would cause substantial re-suspension of PCBs and other contaminants into Bay waters. Capping the shoreline sediments should be fully justified and a reasonable approach to accomplishing cap construction on the shoreline should be provided, or capping of this area should be removed from Alternative 3. Excavation and removal of the shoreline sediments should be included in Alternative 3.

75. **Section 12.2.3.5, Landfill Gas Control, Page 12-17:** It is unclear why it has been assumed that landfill gas would not be generated in the East Adjacent and Panhandle Areas since wood, clothing and other putrescible materials were found in the TCRA excavations. A soil gas survey is needed to evaluate whether landfill gas control systems are needed in these areas. Please delete the assumption that landfill gas will not be generated in these areas, and propose and conduct a soil gas survey to determine whether landfill gas control systems are needed.

76. **Figure 12-1, Conceptual Grading Plan, Alternative 3:** The legend contains green symbols for "landfill extent" and "extent of the existing landfill cap," but these symbols were not used on the figure. In addition, the grey hatched area symbol is not included in the legend. Please revise Figure 12-1 to include the extent of the landfill and the existing landfill cap. Please also define the grey hatched symbol.

    In addition, it is unclear why a top elevation over 40 feet is necessary for the landfill cap. The highest existing grade appears to be about 30 feet, so it appears that some regarding could allow the maximum height of the cap to be less and require less steep slopes. Please consider lowering the maximum height of the landfill cap or explain why a maximum elevation of 40 feet is necessary.

77. **Section 13.3.1, Overall Protection of Human Health and the Environment, Page 13-10; Section 13.3.3, Long-Term Effectiveness and Permanence, Page 13-11; and Section 14.1, Long-Term Effectiveness, Page 14-2:** The text in these sections states that migration of contaminated groundwater would be controlled because the cap would significantly reduce infiltration, but the FS does not provide information to support this conclusion. The concern is that most of the groundwater entering Parcel E-2 appears to be lateral flow from upgradient areas, or upward flow from the B aquifer, not on-site infiltration. Section 2.2.2.3 suggests this would be the case. Therefore a more definite,

quantitative approach is necessary to ensure minimal groundwater entry into, and contaminants exiting from, Parcel E-2. Groundwater data should be available to determine the rate of flow through the landfill, and the contaminant load in the discharge(s). Adequate containment may require upgradient and downgradient barriers, essentially surrounding the parcel. An active pumping system might be effective in controlling groundwater. Please provide the hydrogeologic information needed to support a more informed decision on the need for subsurface barriers or other control systems.

78. **Section 13.3.2, Compliance with ARARs, Page 13-10:** Since groundwater quality has been impacted by the landfill, groundwater is discharging to San Francisco Bay at concentrations that likely exceed aquatic criteria, and Alternative 3 does not include groundwater containment, it is unclear why the text indicates that Alternative 3 meets potential chemical specific Applicable or Relevant and Appropriate Requirements (ARARs) for groundwater. Please revise Alternative 3 to include groundwater containment or revise Section 13.3.2 to indicate that ARARs for groundwater are not being met.

Appendix I, Groundwater Beneficial Use Evaluation

1. **Appendix I, Section I2.2, Surface Water Replenishment, Pages 2-1 and 2-2:** It is unclear why the potential use of groundwater to establish and maintain the proposed freshwater wetlands is not discussed in this section. Please include this potential use of groundwater in the discussion.

2. **Appendix I, Section I2.3, Municipal and Domestic Drinking Water Supply, Page 2-2:** This section does not clearly state that the Basin Plan has not been amended to incorporate the RWQCB determination. Since it is unclear if such an amendment would be adopted, the text should indicate this uncertainty. Please revise the text to state that the Basin Plan has not been amended to incorporate the RWQCB determination and that it is uncertain whether this will be done.

3. **Appendix I, Section I4.1.8, Cost of Cleanup to Federal Drinking Water Standards, Page 4-5; Section I4.1.10, Summary of the A-Aquifer Site-Specific Factors, Page 4-6; Section I4.2.8, Cost of Cleanup to Federal Drinking Water Standards, Page 4-9; and Section I4.2.9, Summary of the B-Aquifer Site-Specific Factor Evaluation:** The text in Sections I4.1.8 and I4.2.8 states that a cost estimate to reduce concentrations of naturally occurring antimony, arsenic, and thallium, has not been produced and then concludes that to remove these metals "the cost would likely be prohibitive, and it may be technically impracticable to do so." Similarly, in Section I4.1.10, it is concluded that site specific factors include "[p]rohibitive cost to remove naturally occurring dissolved metals from the groundwater to meet federal and State Drinking water standards." A similar statement is made in Section I4.2.9. No supporting evidence has been provided to justify these conclusions. Standard technologies like granular media filtration (i.e., a sand filter) can be used to remove metals from water. These technologies are neither cost

prohibitive nor technically impracticable. Please delete the quoted statements and those that are similar in Sections I4.2.8 and I4.2.9 or provide costs and technical justification for these conclusions.

4. **Appendix I, Sections I5.1 A-Aquifer, Page 5-1:** The last sentence in this paragraph states, "The A-Aquifer at E-2 is also considered to be unsuitable as a potential drinking water source based on federal groundwater classification criteria ...". The A-Aquifer is Class II groundwater (potential drinking water) and it does not meet criteria for re-classification. Please delete the quoted statement.

Appendix M, Evaluation of Groundwater Chemical Migration to the Aquatic Environment

1. **Section M1, Introduction, Page 1-1 and Section M2, Aquatic Evaluation Methodology, Page 2-1:** The statement in Section M2 that B-aquifer groundwater does not result in direct exposure to the Bay has not been sufficiently substantiated, "B-aquifer data were evaluated, as a conservative measure, even though the migration of chemicals in B-Aquifer groundwater do not result in direct exposures to aquatic receptors in the Bay." A similar statement appears in Section M1. Please provide adequate evidence of that the B-aquifer does not result in direct exposure to the aquatic receptors or remove these statements from the text.

2. **Section M3.1, Anions, Sulfide, Page 3-3:** Since the detection limit for sulfide (1000 ug/L) significantly exceeds the aquatic criterion of 2 ug/L, it should not be concluded that sulfide has not recurred in wells within or near the TIZ (e.g., IR01MW48A, IR01MWI-3, IR01MW44A, IR01MW38A) and the elevated detection limits should be discussed. The reason for the elevated detection limits should be assessed and measures to achieve lower detection limits should be evaluated. Please revise the text to state that the recurrence of sulfide cannot be ascertained because of the elevated detection limits (DLs) and discuss reasons for the elevated DLs. Also, please identify the extent of sulfide contamination as a data gap and recommend that measures be taken to achieve lower DLs or RLs.

3. **Section M3.2, Metals:** Figures in the Draft Final Parcel E RI (1997) indicate that the following metals also exceeded NAWQCs:

   Arsenic – IR01MWI-9, IR01MW62A
   Chromium – I R01MWI-9, R-1MW62A, IR01MWI-5, IR01MW18A

   In addition, some metals were observed above NAWQCs or CTRs in wells but these analytical results are not shown on figures or discussed in the text:

   Copper - IR01MWI-9, IR01MW62A, IR01MW48A, IR01MWI-5
   Lead - IR01MWI-9, IR01MW31A, IR01MW18A, IR01MW42A, IR01MW05A, IR01MWI-2
   Nickel - IR01MWI-9, IR01MW62A, IR01MW48A

Please include an analysis of these metals and include analytical results for the listed wells in this section.

Appendix O, Wetlands Evaluation and Mitigation Options

1. **Appendix O, Section 3.3.3, Restoration on Parcel E-2 Following Containment, Page 3-4:** Please use the term Panhandle instead of adjacent in the phrase: "on top of the cap in the adjacent areas".

2. **Appendix O, Section 4.1, Conceptual Designs, Page 4-1:** The text states that Figure 12-11 "shows a net expansion of tidal wetlands along the shoreline," but this figure shows the extent of wetlands in 2001 and 2002. Please cite the correct figure(s).

3. **Appendix O, Section 4.2.1, Fresh Water Wetlands, Page 4-2:** It is not sufficient to use the phrase "poorly drained soil," since this could refer to any type of soil where drainage is poor; instead, hydric soil capable of supporting wetlands should be specified. Please delete the quoted phrase and specify the need for hydric soil.

Appendix P2, Landfill Gas Generation Modeling

1. Appendix P2, Section 1.0, bullet 6 indicates that the output of the landfill gas model (LFGM) was compared to recent landfill gas (LFG) data, but a comparison of the LFGM results with IR01/21 LFG data is missing from this appendix. As a result, it is not possible to evaluate which of the four calculated values most closely approximates LFG production in the IR01/21 landfill. Please provide this missing comparison.

Human Health Risk Assessment

GENERAL COMMENTS

1. The use of industrial soil screening criteria should not be considered as an adequate measure to screen against a site that, in part, is reasonably anticipated to be deemed as open space (which is associated with a recreational land use scenario). According to USEPA's 2002 Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, sites where anticipated future land use is recreational typically necessitate a site-specific modeling approach for generating soil screening levels (SSLs). However, since exposure scenarios may be compatible to residential exposures, application of residential SSLs to the site may be a reasonable alternative to a site-specific approach. Consequently, please provide rationale for screening a recreational land use scenario against industrial soil screening values which fail to be protective of children. If rationale for such an approach is not offered, please consider using residential soil SSLs (e.g., USEPA Region 9 residential soil PRGs) in the refinement of

the contaminants of potential concern (COPCs) list to ensure that contaminant levels are protective of exposures potentially incurred by children.

2. Section 7 and Appendix K do not provide sufficient detail on the evaluation of the chemical data for use in the HHRA. For example, the methodology underpinning the use and/or elimination of analytical data in the risk evaluation is not adequately discussed. Although Section 4 of the RI/FS indicates that COPCs within each study area and depth were refined by eliminating compounds that were either not detected above the method detection limit (MDL) or did not exceed their established Hunter's Point Ambient Level (HPAL), Section 7 and Appendix K fail to describe the treatment of non-detect results. The data evaluation portion of the HHRA should present a discussion surrounding treatment of all analytical results, including non-detect results. Within such a discussion, the Navy should present the uncertainties associated with phenomena such as cases where a reporting limit (preferably a sample quantitation limit) exceeds the most relevant health-based screening criterion. Essentially, although an analyte may be present at or below its quantitation limit, it still may be present at an environmentally-significant level (e.g., health-based standard). Please revise the HHRA to include additional detail on the data usability evaluation that was conducted for the data set.

3. In the evaluation of dioxins/furans, please consider generating a total toxic equivalency quotient (TEQ) as opposed to evaluating these compounds on the basis of a single congener. Van den Berg (2006) presents updated toxic equivalency factors (TEFs) for a number of individual congeners.

4. Because substantial ingestion and inhalation exposures to surface and subsurface soil contaminants may be plausibly incurred by a construction worker receptor, it is not clear why only exposures related to direct and indirect contact (i.e., incidental soil ingestion, dermal adsorption, and inhalation of volatiles and fugitive dust) with subsurface media have been evaluated for this particular population receptor. For a construction worker receptor, please also evaluate risks and hazards not only associated with direct and indirect contact to contaminants in subsurface media but also to contaminants in surficial soil.

5. Exposure parameter values used to derive intake for a recreational exposure scenario are not reflective of USEPA parameter values. Please refer to USEPA's 2006 Child-Specific Exposure Factors Handbook (ChEFH) and USEPA 2002 to derive pertinent exposure parameter values for a child and adult recreator, accordingly, and consider use of the parameter values presented in the aforesaid documents during deliverable development in the future.

SPECIFIC COMMENTS

1. **Section 7.1.2.2: Human Health Risk Assessment Results for Construction Worker Scenario, Page 7-5**: There appears to be some disconnect between the last sentence

(starting with "For the construction worker scenario [0 to 2 feet bgs]...") in the first paragraph under Section 7.1.2.2 (and Tables 7-6 and 7-7. That is, the last sentence of the first paragraph under Section 7.1.2.2 suggests Tables 7-6 and 7-7 present total and incremental risks and hazards associated with exposure to contaminants in surficial soils when the Tables actually present total and incremental risks and hazards that coincide with exposure to subsurface soils at 0 to 10 ft bgs. Please revise the final sentence in the first paragraph under Section 7.1.2.2 to reflect subsurface depth.

2. **Table 7.11: Risk Characterization Analysis for B-Aquifer Groundwater Based on Domestic Uses**: In Table 7.11, please consider revision of the Table to include the USEPA Region 9 tap water PRGs used to derive the cancer risk and non-cancer hazard estimates.

3. **Figure 7-5, Locations with Chemical Concentrations Exceeding the Protective Soil Concentration in 0-3' Soil**: Please include a location map for Parcel E-2 as reference and to maintain consistency with the other site figures.

4. **Appendix K, Section K9.3, Dermal Contact with Groundwater for Residential Scenario**: While it is appropriate to include a discussion of the uncertainty associated with excluding dermal contact with groundwater in the evaluation of potential groundwater exposures under the residential scenario, it is not appropriate to diminish this uncertainty with the statement that "the effect of this underestimate is not significant because the overall cancer risk and noncancer HI for domestic use of groundwater in the B-aquifer were found to exceed the risk and hazard thresholds..." USEPA (2004) recommends a screening process that identifies chemicals that should be evaluated for the dermal pathway based on whether the dermal pathway has been estimated to contribute more than 10% of the oral pathway. Considering the ratios of the dermal exposure route relative to the ingestion route for non-volatile COPCs of up to 3,388 percent (as presented in Table K-20), the underestimation of risks as a result of excluding the dermal evaluation may be highly significant in some cases. Please revise the text to acknowledge this.

Ecological Risk Assessment

1. **Section L1.1, Overview of the Ecological Risk Assessment Process, Page 1-2:** The last paragraph of this section indicates that further refinement of the ecological risks, using food chain modeling for birds and mammals, was not considered necessary given that human health risk evaluations have shown cancer risks greater than 1 x 10-6 and total noncancer hazard indices greater than 1.0 in the majority of Parcel E-2 areas. Human risk results cannot be used as a basis for excluding further refinement of ecological risks without justification or demonstration that the cleanup goals based on human risk exceedence are protective of ecological exposure to include food chain exposures. Please clarify how human risk exceedences would justify excluding food chain analysis from the ecological risk assessment.

REFERENCES

Tetra Tech, Inc. (2004) *Revised Final Parcel E Groundwater Summary Report, Phase III Groundwater Data Gap Investigation.* May 11.

USEPA (1988) *Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy.*

USEPA (1993) *Presumptive Remedy for CERCLA Municipal Landfill Sites,* EPA/540/F/93/035. September

USEPA (2002) *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.* Washington, D.C.: Office of Solid Waste and Emergency Response (OSWER), United States Environmental Protection Agency (USEPA). OSWER 9355.4-24.

USEPA (2004) *Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).* Final. EPA/540/R/99/005. Office of Superfund Remediation and Technology Innovation. July.

USEPA (2006) *Child-Specific Exposure Factors Handbook (External Review Draft).* Washington, D.C.: National Center for Environmental Assessment (NCEA), Office of Research and Development (ORD), United States Environmental Protection Agency (USEPA). EPA/600/R/06/096A External Review Draft.

Van den Berg M, Birnbaum LS, Denison M, De Vito M et al. (2006). *The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (REVIEW).* Toxicological Sciences 93(2):223-241.